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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/581,281	05/31/2006	Larry C. Olsen	23-65037-09	3124

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EXAMINER

MOWLA, GOLAM

ART UNIT	PAPER NUMBER
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1723

NOTIFICATION DATE	DELIVERY MODE
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08/11/2011

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/581,281	OLSEN ET AL.	
	Examiner	Art Unit	
	GOLAM MOWLA	1723	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 April 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 37-66 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 37-66 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>See Continuation Sheet</u> . | 6) <input type="checkbox"/> Other: _____ |

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :04/16/2010, 10/04/2010, 01/12/2011 and 05/10/2011.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 04/16/2010 has been entered.

Response to Amendment

2. Applicant's amendment of 04/16/2010 does not place the Application in condition for allowance.
3. Claims 37-66 are currently pending. Applicant has amended claims 37, 45, 50, 56-57 and 61-62, and cancelled claims 1-36 and 67-85.

Status of the Objections or Rejections

4. The objection to the claim 61 is withdrawn in view of Applicant's amendment.
5. Due to Applicant's amendment to claims 37, 45, 50, 56-57 and 61-62, all rejections from the office Action dated 12/16/2009 are withdrawn. However, upon further consideration, a new ground of rejection is presented below.

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Claim Rejections - 35 USC § 112

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Claims 50-66 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

There is no support in the original specification of the instant application, the specification of the PCT Application PCT/US04/40460, the specification of the parent application 10/726,744, the specification of the parent application 10/727,062, or the specification of the provisional application 60/558,298 for “the apparatus not including an electrical and/or mechanical power device, other than gravity, external to the high temperature heat pipe acting on the working fluid to transfer heat to and from the thermoelectric device” as recited in claim 50, lines 11-13.

Applicant is requested to provide support for this limitation.

Claim Rejections - 35 USC § 103

8. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

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9. Claims 50-62 are rejected under 35 U.S.C. 103(a) as being unpatentable over Migowski (WO 89/07836) in view of Simeray et al. (US 6,340,787), Stachurski (US 4125122) and Bass et al. (US 6,207,887).

Regarding claims 50-51 and 57, Migowski in figures 2-4 teaches an apparatus for generating electrical energy (thereby functions in Seebeck mode) from an environment having a first temperature region (7) and second temperature region (7) comprising thermoelectric device (5) having a first side in communication with the first temperature region (7) and a second side in communication with the second temperature region (7). Migowski further discloses the thermoelectric device comprises discrete thin film thermoelements (n-type and p-type thermoelement) (see fig. 2) formed of semiconductors (3rd full paragraph of page 3). Migowski et al suggest use of their thermoelectric generator for general "power supply units, etc" (Page 3, 6th full paragraph).

However, the reference is silent as to the use of high-temperature and low-temperature heat pipes connected to a hot connection and cold connection of the thermoelectric device, respectively.

Simeray et al teach low-power thermoelectric generation using small temperature gradients, as used by Migowski et al, specifically teaching that the first and second temperature regions can be the ground and the air above the ground (Figure 6; Column 6, lines 17-30) or air inside a building and air outside a building. (Figure 5, Column 6, lines 10-16). Simeray et al disclose a heat pipe (74) connected to the first end and buried in the ground (Figure 6), a second heat pipe (73) coupled to the second end. Such a "heat exchanger" and "thermal collection stake" read on the instant heat pipes, as they conduct heat to the respective hot and cold junctions.

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It would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the method of Migowski by employing the generators in locations such as between the ground and air, or in a wall of a building, as taught by Simeray, because Simeray teaches that such locations provide suitable temperature gradients for low power thermoelectric generators and Migowski suggests that his generators may be used generally in power supply units. Such a combination will provide the predictable result of successfully generating power.

However, the references are silent as to the use of a working fluid in order to transfer heat to and from the thermoelectric device.

It is well known in the thermoelectric art to utilize a working fluid which goes through phase change from liquid to vapor or vapor to liquid state in order to deliver the heat to and/or from the TE module as taught by Stachurski (see figures, col. 2, lines 12-29, and col. 3, line 67 to col. 4, line 52) (see abstract). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized a working fluid which goes through a phase change as taught by Stachurski in the apparatus of Migowski in order deliver the heat to and/or from the TE device to convert the heat to electricity.

Migowski as modified does not explicitly disclose that the thin film thermoelements are assembled in alternating p- and n-type arrays.

Bass et al disclose a series-parallel connection scheme for a thermoelectric generator (Figure 13A; Column 6, lines 46-62) in which plural n-type elements are connected electrically in parallel and are connected in series to a plurality of p-type elements that are connected to each other in parallel. Four thermoelements are present in each resulting couple.

It would have been obvious to one having ordinary skill in the art to modify the method of Migowski by employing the series-parallel connection scheme of Bass et al, because Bass et al teach that such connection protects against complete power loss in the event of damage to a single thermoelement, thus providing increased reliability (Column 6, lines 46-62).

Regarding claim 52, the limitation “the thermoelectric device comprises metallic wire thermocouples...” is optional to the apparatus of claim 50. Since Migowski as modified explicitly teaches the use of discrete element semiconductors assembled in alternating p-type and n-type) arrays (see fig. 2), the instant claim is rejected.

Regarding claim 53, Migowski as modified further discloses the thin film thermoelectric elements are connected in series (see Bass et al.).

Regarding claims 54-56, Migowski further teaches forming the p- and n-type thermocouples from Bi, Te, Sb, Se, or Pb (3rd full paragraph of page 3). As bismuth telluride and other claimed compounds are conventional thermoelectric materials, selection of these known materials based on this listing would have been obvious to one having ordinary skill in the art. Migowski further discloses sputter deposition of the thermoelements (1st full paragraph on page 3).

Regarding claims 58-59, Migowski further discloses the means for transmitting ambient energy is an ambient energy transmission means by conduction means (see fig. 3 and last full paragraph on page 4).

Regarding claims 60-62, Migowski further discloses the apparatus being used in a sensor system and comprises a battery or capacitor for alternately storing and discharging electrical energy produced by the thermoelectric devices (see paragraph bridging pages 2 and 3; 7th full

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paragraph on page 3 starting “In addition to the use...”; 7th full paragraph on page 4 starting “It is also conceivable...”).

10. Claims 50-66 are rejected under 35 U.S.C. 103(a) as being unpatentable over Albsmeier et al. (WO 02/095707) in view of Migowski (WO 89/07836), Simeray et al. (US 6,340,787), Stachurski (US 4,125,122) and Bass et al. (US 6,207,887).

Regarding claims 50-66, Albsmeier is directed to an apparatus for generating electrical energy (Figure 1) from an environment having a first temperature region and a second temperature region comprising a thermoelectric device (1) having a first side and a second side wherein the first side is in communication with a means for transmitting ambient thermal energy collected in the first temperature region (see abstract). Albsmeier further teaches the apparatus further comprising a means for alternately storing and discharging electrical energy produced by the thermoelectric device consisting of a capacitor (7), at least one sensor powered by electrical energy from the capacitor (8), at least one transmitter powered by the capacitor and capable of transmitting data gathered by the sensor (5, 6), a voltage amplifier for amplifying the voltage of electrical energy generated by the thermoelectric device (3), and one microprocessor capable of processing the data and data storage means capable of storing the data (4) (see abstract and Figure 1).

However, the reference is silent as to the disclosure of the thermoelectric device (1).

Migowski in view of Simeray, Stachurski and Bass, as discussed above, discloses an apparatus for generating electrical energy wherein the thermoelectric device is according to

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claims 50-62 (see full description above) and further discloses that it can be used in a sensor system (see 7th full paragraph on page 3).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized the thermoelectric device of Migowski in view of Simeray and Stachurski in the apparatus of Albsmeier, because the thermoelectric device of Migowski in view of Simeray and Stachurski generates enough electric power and voltage, as taught by Migowski in view of Simeray and Stachurski.

Double Patenting

11. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

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A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

12. Claims 37-49 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-13 of U.S. Patent No. 7,834,263 B2. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of U.S. Patent No. 7,834,263 B2 encompass the limitation of the pending claims 37-49.

13. Claims 50-59 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 37-46, 48-49 and 52-55 of copending Application No. 11/004,611 in view of Bass et al. (US 6,207,887).

Regarding claims 50-59 of the instant application, claims 37-46, 48-49 and 52-55 of copending Application No. 11/004,611 encompass every limitation of the pending claims 50-59 except that the copending Application No. 11/004,611 does not claim whether the thin film thermoelements are assembled in alternating p- and n-type arrays.

Bass et al disclose a series-parallel connection scheme for a thermoelectric generator (Figure 13A; Column 6, lines 46-62) in which plural n-type elements are connected electrically in parallel and are connected in series to a plurality of p-type elements that are connected to each other in parallel. Four thermoelements are present in each resulting couple.

It would have been obvious to one having ordinary skill in the art to modify the method of Migowski by employing the series-parallel connection scheme of Bass et al, because Bass et al teach that such connection protects against complete power loss in the event of damage to a single thermoelement, thus providing increased reliability (Column 6, lines 46-62).

This is a provisional obviousness-type double patenting rejection.

Response to Declaration under 37 CFR §1.132

14. Applicant's Declaration of 12 May 2010 is considered to sufficiently demonstrate the criticality of the claimed dimensions (L/A ratio), for the reasons discussed therein. Since no specific teaching of such dimensions in thin film thermocouples is present in the prior art of record, the previous prior art rejections are withdrawn.

Response to Arguments

15. Applicant's arguments with respect to claims 37-66 have been considered but are moot in view of the new ground(s) of rejection as necessitated by the amendments.

With respect to Applicant's arguments showing support for "the thermoelectric power source does not include an electrical and/or mechanical power device, other than gravity, external to the low temperature heat pipe or the high temperature heat pipe acting on the working

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fluid to transfer heat to and from the thermoelectric module”, MPEP at §2173.05(i) clearly states that “any negative limitation or exclusionary proviso must have basis in the original disclosure” and “any claim containing a negative limitation which does not have basis in the original disclosure should be rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement”. Although Applicant argues that the instant disclosure mentions no need of an external electrical or mechanical power device to run the disclosed power source, the use of an external electrical or mechanical power device to run the disclosed power source is **not precluded**. On the contrary to Applicant’s contention, instant disclosure is open to use of any operational modes (see p. 22, lines 20-29). Hence, the use of an external electrical or mechanical power device to run the disclosed power source is **not precluded**, and therefore, Examiner is maintaining the new matter rejection.

Correspondence/Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GOLAM MOWLA whose telephone number is (571) 270-5268. The examiner can normally be reached on M-Th, 0800-1830 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner’s supervisor, ALEXA NECKEL can be reached on (571) 272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

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/G. M./

Examiner, Art Unit 1723

/Alexa D. Neckel/

Supervisory Patent Examiner, Art Unit 1723